(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3: 10.10.2001 Bulletin 2001/41

(51) Int Cl.7: H04L 5/02

(43) Date of publication A2: 19.05.1999 Bulletin 1999/20

(21) Application number: 98309092.9

(22) Date of filing: 06.11.1998

(84) Designated Contracting States:

AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU

MC NL PT SE

Designated Extension States:

AL LT LV MK RO SI

(30) Priority: 14.11.1997 US 969886

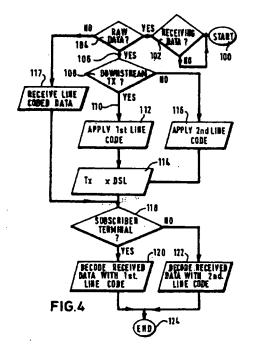
(71) Applicant: Nortel Networks Limited Montreal, Quebec H2Y 3Y4 (CA)

(72) Inventor: Dyke, Peter John
Saffron Walden, Essex CB11 13SP (GB)

(74) Representative: Bewley, Ewan Stuart et al Nortel Networks Intellectual Property Law Group London Road Harlow, Essex CM17 9NA (GB)

(54) Method and apparatus for reducing cross talk using line coding

(57) To accommodate the overlay of broadband information over narrowband signals while reducing cross-talk in upstream and downstream directions, different baseband line codes are used to modulate respective upstream and downstream transmissions on a common wireline communication resource, such as a twisted copper-pair. In this way, filtering components located at each end of a connection can reject cross-talk based upon dissimilar signal characteristics that arise between wanted broadband signals having a first baseband line code and spectrally-shifted cross-talk emanating from interfering broadband signals having a different baseband line code.



EP 0 917 314 A



EUROPEAN SEARCH REPORT

Application Numbe
P 98 30 9092

Category	Citation of document with of relevant pa	n indication, where appropriate, ssages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
x	US 5 680 394 A (TO 21 October 1997 (22 * abstract; claims 6 * * column 1, line 5 * column 3, line 6 * * column 3, line 6 * * column 5, line 6 * * column 5, line 6 * * column 7, line 6 * * column 8 * column 9	ONG PO ET AL) 1997-10-21) 5 1,5,6,11-13,20; figure 39 - line 61 * 60 - line 26 * 61 - line 21 * 62 - line 35 * 63 - line 35 *	1-30	H04L5/02
	US 5 515 378 A (07 7 May 1996 (1996-6 * column 1, line 1 * column 7, line 2 * column 9, line 1 * column 9, line 4 * column 24, line claims 3,4,7 *	5-07) 8 - line 47 * 7 - line 32 *	1-30	
	WO 97 06619 A (TEL (SE)) 20 February * abstract; claims * page 1, line 10 * page 2, line 28 * page 3, line 25 * page 4, line 27 * page 6, line 31	1,2,4,7 * - line 19 * - line 38 * - line 32 * - line 30 * line 11 *	1-30	TECHNICAL FIELDS SEARCHED (Int.CL.6) H04L
		-/		
	The present search report has	been drawn up for all claims		
_	Place of search	Date of completion of the search		Ехатіпог
	BERLIN	15 August 2001	Bing	er, B
X : particu Y : particu docum	EGORY OF CITED DOCUMENTS startly relevant if taken alone tarrly relevant if combined with anode em of the same category logical background itten disclosure	T : theory or principle E : earlier patient docu- after the filing date D : document cited in L : document cited for	ment, but publish the application other reasons	ention ad on, or



EUROPEAN SEARCH REPORT

EP 98 30 9092

ategory	Citation of document with i of relevant pass	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)	
	GB 2 311 196 A (NOI 17 September 1997 * abstract; claims * page 1, line 11 * page 3, line 20 * page 5, line 31 * page 7, line 17 * page 9, line 1 -	(1997-09-17) 1-3,5,7; figure 3 * page 2, line 9 * page 4, line 16 * page 6, line 11 *	1-30	
				TECHNICAL FIELDS SEARCHED (Int.Cl.5)
	The present search report has t	peen drawn up for all claims Date of completion of the search		Examiner
	BERLIN	15 August 2001	Bino	jer, B
CA X : partic Y : partic docur A : techr	TEGORY OF CITED DOCUMENTS cutarly relevant if taken alone utarly relevant if combined with anoth mem of the same category lological background written disclosure mediate document	T : theory or princ E : earlier patent c after the filing t ter D : document cite L : document cite	ple underlying the im locument, but publish late I in the application I for other reasons	rention red on, or

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 98 30 9092

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

15-08-2001

AU 6478296 A 10-02-19 CN 1190511 A 12-08-19 EP 0838109 A 29-04-19 JP 11509062 T 03-08-19 WO 9703506 A 30-01-19 US 5838667 A 17-11-19 US 5515378 A 07-05-1996 AT 183865 T 15-09-19 AU 670766 B 01-08-19 AU 3145493 A 19-07-19 CA 2125571 A 24-06-19 DE 69229876 D 30-09-19 DE 69229876 D 30-09-19 EP 0616742 A 28-09-19 EP 0926916 A 30-06-19 ES 2137197 T 16-12-19 FI 942771 A 10-06-19 US 5546090 A 33-08-19 US 5546090 A 13-08-19 US 5546090 A 13-08-19 US 552490 A 07-01-19 US 552490 A 07-01-19 US 552490 A 07-01-19 US 5625880 A 29-04-19 US 5625880 A 29-04-19 US 5625880 A 27-10-19 US 5828658 A 27-10-19	Patent document cited in search report				family er(s)	Publication date
AU 670766 B 01-08-19 AU 3145493 A 19-07-19 CA 2125571 A 24-06-19 DE 69229876 D 30-09-19 DE 69229876 T 30-12-19 EP 0616742 A 28-09-19 EP 0926916 A 30-06-19 ES 2137197 T 16-12-19 FI 942771 A 10-06-19 JP 7505017 T 01-06-19 W0 9312590 A 24-06-19 W0 9818272 A 30-04-19 US 5546090 A 13-08-19 US 5546090 A 13-08-19 US 55625880 A 29-04-19 US 5592490 A 07-01-19 US 5642353 A 24-06-19 US 5828658 A 27-10-19 US 5828658 A 27-10-19	US 5680394	A 2	1-10-1997	AU 647 CN 119 EP 083 JP 1156 WO 976	78296 A 90511 A 38109 A 99062 T 93506 A	08-06-2000 10-02-1997 12-08-1998 29-04-1998 03-08-1999 30-01-1997 17-11-1998
SE 9502775 A 05-02-199	US 5515378	Α θ	7-05-1996	AU 67 AU 314 CA 212 DE 6922 DE 6922 EP 061 EP 092 ES 213 FI 94 JP 756 WO 931 WO 981 US 554 US 559 US 559	70766 B 45493 A 25571 A 29876 D 29876 T 16742 A 26916 A 37197 T 42771 A 25771 A 2590 A 48272 A 46090 A 42353 A	15-09-1999 01-08-1996 19-07-1993 24-06-1993 30-09-1999 30-12-1999 28-09-1994 30-06-1999 16-12-1999 10-06-1995 24-06-1993 30-04-1998 13-08-1996 29-04-1997 07-01-1997 24-06-1997 27-10-1998
GB 2311196 A 17-09-1997 EP 0886926 A 30-12-199	WO 9706619	A 20	9-02-1997			16-12-1998 05-02-1997
WO 9735399 A 25-09-199	GB 2311196	A 1	7-09-1997	WO 973	35399 A	30-12-1998 25-09-1997 19-09-2000

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82